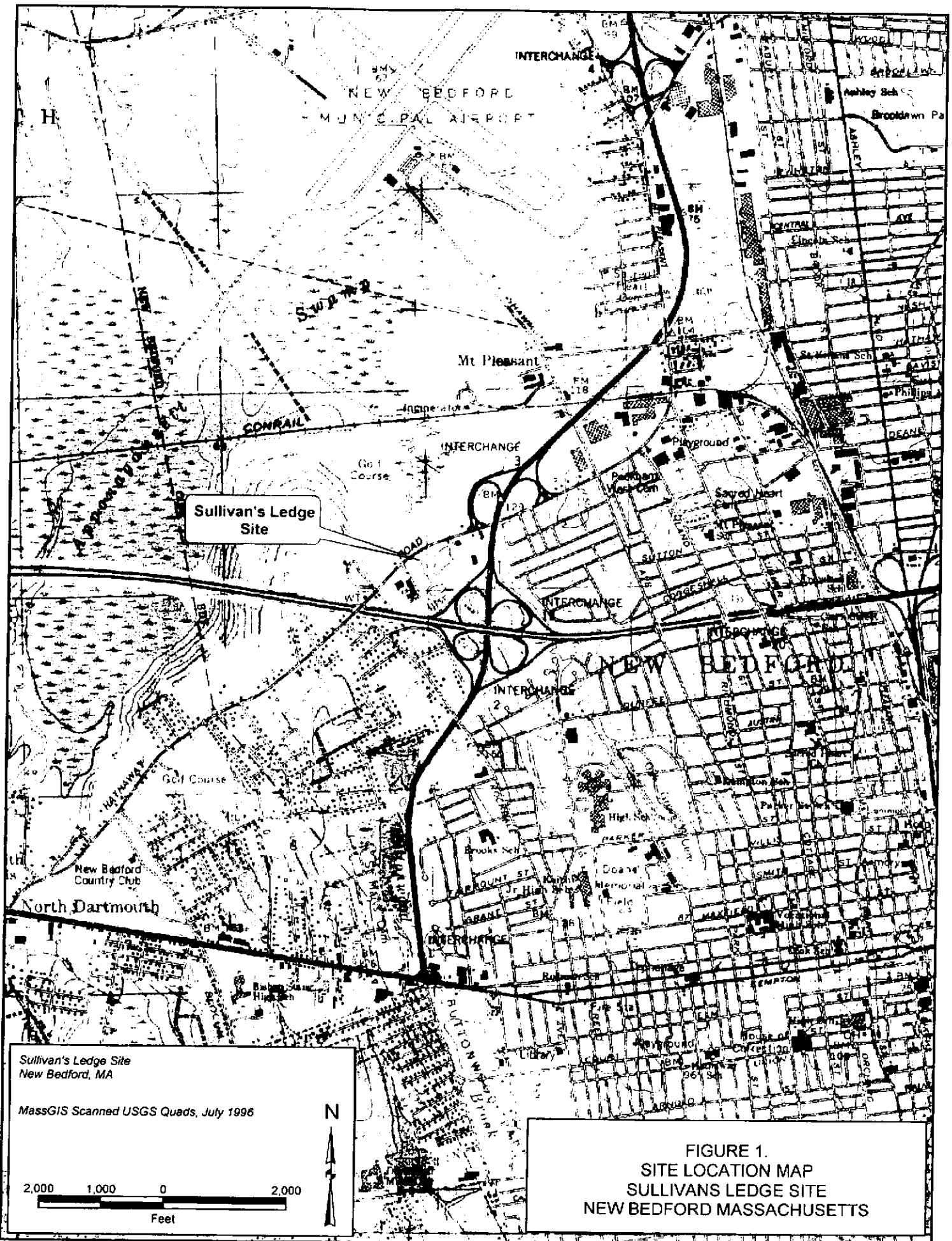
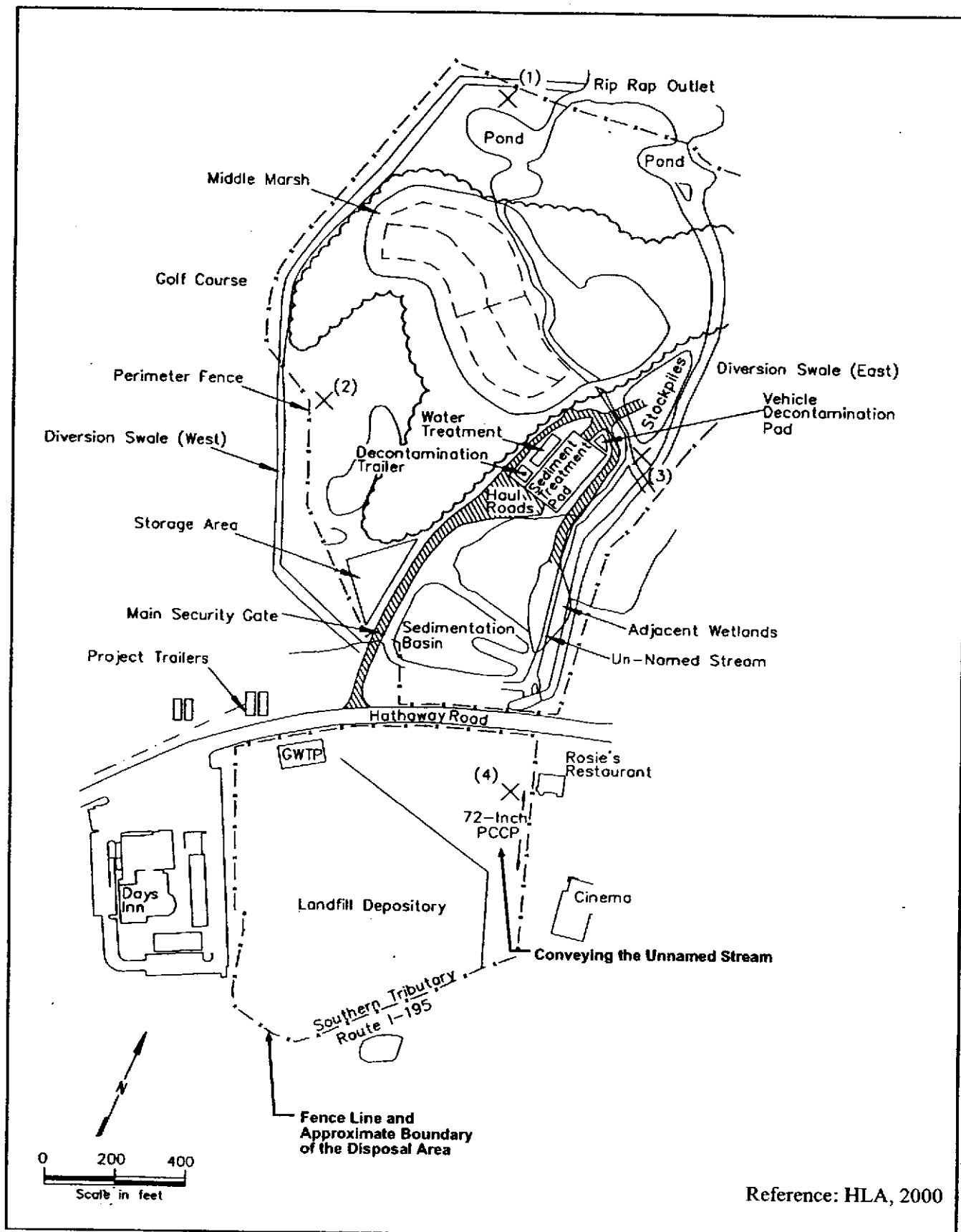


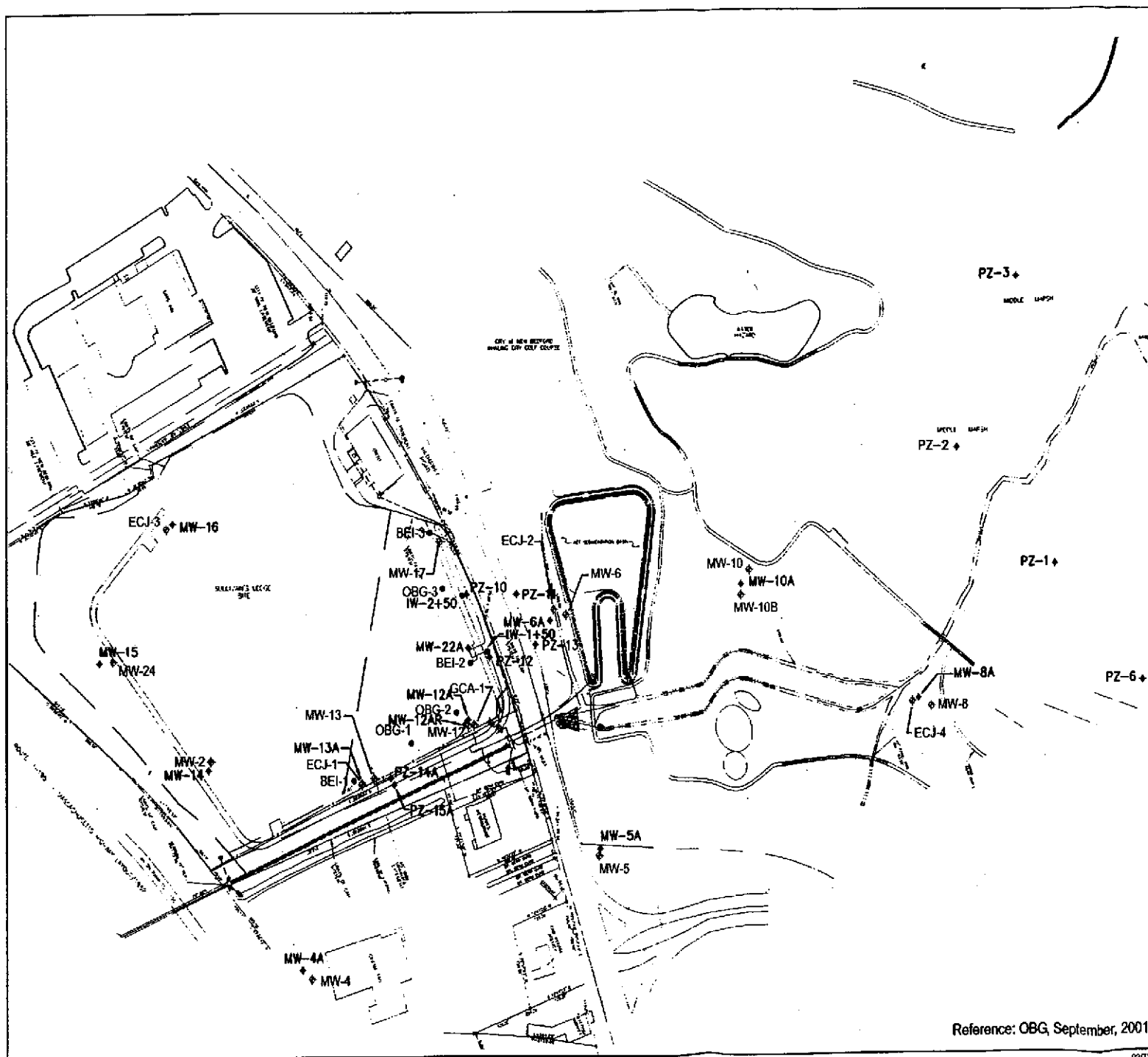
**ATTACHMENT 1**  
**SITE MAPS**



Originals in color.



**FIGURE 2. SITE PLAN**  
**SULLIVAN'S LEDGE SUPERFUND SITE**  
**NEW BEDFORD, MASSACHUSETTS**



# LEGEND

◆ MONITORING WELL LOCATION

○ RECOVERY WELL LOCATION



200 0 200  
SCALE IN FEET

**FIGURE 3.**  
**GROUNDWATER WELL LOCATIONS**  
**SULLIVAN'S LEDGE SUPERFUND SITE**  
**NEW BEDFORD, MASSACHUSETTS**

Reference: OBG, September, 2001

027341

**ATTACHMENT 2**  
**LIST OF DOCUMENTS REVIEWED**

Dames & Moore, Inc. (Dames & Moore). 1999. *Final Operation and Maintenance Plan, Second Operable Unit, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. Prepared for AVX Corporation. January 13, 1999.

EBASCO Services Incorporated (EBASCO). 1987. *Phase I Draft Final Remedial Investigation, Sullivan's Ledge Site, New Bedford, Massachusetts*. September 1987.

EBASCO Services Incorporated (EBASCO). 1989. *Volume I Draft Final Remedial Investigation, Sullivan's Ledge, New Bedford, Massachusetts*. January 1989.

EBASCO Services Incorporated (EBASCO). 1989. *Volume II Draft Final Feasibility Study Report, Sullivan's Ledge, New Bedford, Massachusetts*. January 1989.

Metcalf & Eddy, Inc. (M&E). 1991a. *Final Remedial Investigation, Additional Studies of Middle Marsh, Sullivan's Ledge Site, New Bedford, Massachusetts*. Prepared for US Environmental Protection Agency Region I. April 1991.

Metcalf & Eddy, Inc. (M&E). 1991b. *Feasibility Study of Middle Marsh*. Prepared for US Environmental Protection Agency Region I. May 1991.

New England Environmental, Inc. (NEE). 2001. *Sullivan's Ledge Wetland Monitoring Report 2001, New Bedford, MA*. Prepared for Mactec Constructors. March 19, 2002.

New England Environmental, Inc. (NEE). 2003. *OU-1 and OU-2 Wetlands Monitoring Report 2002, Sullivan's Ledge, New Bedford, MA*. Prepared for Mactec. March 4, 2003.

O'Brien & Gere Engineers, Inc. (OBG). 1996a. *Operations and Maintenance Plan, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. October 1996.

O'Brien & Gere Engineers, Inc. (OBG). 1996b. *Post-Construction Environmental Monitoring Plan, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. October 1996.

O'Brien & Gere Engineers, Inc. (OBG). 1996c. *Site Closure Plan, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. October 1996.

O'Brien & Gere Engineers, Inc. (OBG). 1997. *Wetlands Restoration Plan, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. July 1997.

O'Brien & Gere Engineers, Inc. (OBG). 2000a. *Post-Construction Baseline Ground Water*

*Sampling Event, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* April 2000.

O'Brien & Gere Engineers, Inc. (OBG). 2000b. *Ground Water Treatment Plant Operation and Maintenance Manual.* August 2000.

O'Brien & Gere Engineers, Inc. (OBG). 2001a. *Quarterly Groundwater Sampling Event, Spring 2001, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* September 2001.

O'Brien & Gere Engineers, Inc. (OBG). 2001b. *Quarterly Groundwater Sampling Event, Summer 2001, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* December 2001.

O'Brien & Gere Engineers, Inc. (OBG). 2001c. *Summer 2001 Soil/Sediment Sampling Validation Report, Operable Unit 1, Sullivan's Ledge Superfund Site.* December 2001.

O'Brien & Gere Engineers, Inc. (OBG). 2002a. *Quarterly Groundwater Sampling Event, Fall 2001, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* January 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002b. *Sullivan's Ledge Superfund Site, New Bedford, Massachusetts, Site Operations and Maintenance Manual.* February 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002c. *Quarterly Groundwater Sampling Event, Winter 2001, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* March 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002d. *Sullivan's Ledge Superfund Site Operable Unit 1 Remedial Construction Report.* March 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002e. *Quarterly Groundwater Sampling Event, Spring 2002, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* June 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002f. *Quarterly Groundwater Sampling Event, Summer 2002, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* October 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2002g. *Quarterly Groundwater Sampling Event, Fall 2002, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* December 2002.

O'Brien & Gere Engineers, Inc. (OBG). 2003a. *Annual Groundwater Sampling Event, Winter 2002, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* April 2003.

O'Brien & Gere Engineers, Inc. (OBG). 2003b. *Gas Extraction Pilot Study, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts.* May 2003.

O'Brien & Gere Engineers, Inc. (OBG). 2003c. *Quarterly Groundwater Sampling Event, Spring 2003, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. June 2003.

URS Corporation (URS). 2001. *Final Remedial Construction Report Sullivan's Ledge Superfund Site, Second Operable Unit*. Prepared for AVX Corporation. August 13, 2001.

United States Environmental Protection Agency Region I (USEPA). 1989. *ROD Decision Summary, Sullivan's Ledge Superfund Site, New Bedford, Massachusetts*. June 28, 1989.

United States Environmental Protection Agency Region I (USEPA). 1991. *Record of Decision Summary, Sullivan's Ledge Superfund Site, Middle Marsh Operable Unit*. September 27, 1991.

United States Environmental Protection Agency (USEPA). 2001. *Comprehensive Five-Year Review Guidance*. June 2001.

**ATTACHMENT 3  
MONITORING DATA**



**Table A3-1**  
**Comparison of Groundwater Treatment Plant Effluent Data to**  
**City of New Bedford Pretreatment Discharge Limitations**

|  | Effluent Sample<br>from 5/15/03<br>(mg/l) | City of New Bedford<br>Pretreatment Discharge Limitations<br>(mg/l) |
|--|---|---|
| <b><u>Volatile Organic Compounds<sup>(1)</sup></u></b> |   |   |
| Acetone  | 0.043                                     | (2)   |
| Acrolein   | 0.005 U                                   | 4.000   |
| Bromomethane   | 0.026                                     | (2)   |
| 2-Butanone (MEK)                                       | 0.0029                                    | (2)   |
| Chloroethane   | 0.003                                     | (2)   |
| Chloroform   | 0.0041                                    | (2)   |
| Chloromethane  | 0.0031                                    | (2)   |
| <b><u>Polychlorinated Biphenyls</u></b>                |   |   |
| Aroclor 1016   | 0.0005 U                                  | 0.005   |
| Aroclor 1221   | 0.0005 U                                  | 0.005   |
| Aroclor 1232   | 0.0005 U                                  | 0.005   |
| Aroclor 1242   | 0.00098                                   | 0.005   |
| Aroclor 1248   | 0.0005 U                                  | 0.005   |
| Aroclor 1254   | 0.0005 U                                  | 0.005   |
| Aroclor 1260   | 0.0005 U                                  | 0.005   |
| <b><u>Metals</u></b>                                   |   |   |
| Arsenic  | 0.2 U                                     | 1.4   |
| Cadmium  | 0.01 U                                    | 1.2   |
| Chromium   | 0.02 U                                    | 5   |
| Copper   | 0.02                                      | 4.5   |
| Lead   | 0.2 U                                     | 0.6   |
| Mercury  | 0.0002 U                                  | 0.01  |
| Molybdenum   | 0.1 U                                     | (3)   |
| Nickel   | 0.04 U                                    | 2.1   |
| Silver   | 0.02 U                                    | 0.5   |
| Zinc   | 0.1                                       | 3.5   |
| Cyanide  | 0.06                                      | 1.9   |

**NOTES**

1. Only VOCs which were detected or for which there is a discharge limitation have been presented.
2. Total toxic organics (TTO) less than 2.0 mg/l limit.
3. There is no pretreatment discharge limitation for molybdenum.

**Table A3-2**  
**OU-1 Active Recovery System**  
**Points of Compliance - Bedrock Monitoring Wells**

| Well        | Well Screen Location | Total Volatile Organic Compounds (ug/L) |             |             |           |             |             |             |           |             |             |
|-------------|----------------------|---|-------------|-------------|-----------|-------------|-------------|-------------|-----------|-------------|-------------|
|             |                      | Winter 1999                             | Spring 2001 | Summer 2001 | Fall 2001 | Winter 2001 | Spring 2002 | Summer 2002 | Fall 2002 | Winter 2002 | Spring 2003 |
| ECJ-1 (37)  | Shallow Bedrock      | 2297.6                                  | 109.0       | 64.0        | 83.0      | 64.0        | 64.2        | 53.2        | 46.1      | 37.4        | 20.3        |
| ECJ-1 (62)  | Shallow Bedrock      | 72950.1                                 | 9410.0      | 5383.0      | 3180.0    | 1860.0      | 1164.5      | 2017.3      | 1505.0    | 1060.0      | 1350.0      |
| ECJ-1 (72)  | Shallow Bedrock      | 145337.1                                | 26780.0     | 37050.0     | 38330.0   | 41770.0     | 66900.0     | 60690.0     | 56710.0   | 33550.0     | 60800.0     |
| ECJ-1 (122) | Intermediate Bedrock | 71911.5                                 | 8532.0      | 8220.0      | 6670.0    | 13263.0     | 42400.0     | 8155.0      | 32760.0   | 10937.0     | 6290.0      |
| ECJ-1 (148) | Intermediate Bedrock | 36477.2                                 | 74600.0     | 104600.0    | 16270.0   | 18520.0     | 49550.0     | 36390.0     | 71750.0   | 34900.0     | 33180.0     |
| ECJ-1 (267) | Deep Bedrock         | 106.5                                   | 52.1        | 39.8        | 37.5      | 52.5        | -           | -           | -         | 39.5        | -           |
| ECJ-2(47)   | Shallow Bedrock      | 2533.0                                  | 1920.0      | 2468.0      | 1511.0    | 2171.0      | 1150.0      | 2130.0      | 3167.0    | 2970.0      | 1690.0      |
| ECJ-2(82)   | Intermediate Bedrock | 15942.0                                 | 16080.0     | 23990.0     | 15740.0   | 18810.0     | 23470.0     | 27060.0     | 22840.0   | 21200.0     | 14400.0     |
| ECJ-2(117)  | Intermediate Bedrock | 55380.0                                 | 29730.0     | 51600.0     | 37600.0   | 48800.0     | 31680.0     | 31800.0     | 27610.0   | 29600.0     | 35410.0     |
| ECJ-2(152)  | Intermediate Bedrock | 400.4                                   | 4594.0      | 6180.0      | 11330.0   | 19570.0     | 18840.0     | 38640.0     | 46030.0   | 58500.0     | 62100.0     |
| ECJ-2(187)  | Deep Bedrock         | 3605.8                                  | 4440.0      | 76.4        | 43460.0   | 5200.0      | 19220.0     | 2011.0      | 29191.0   | 80240.0     | 24610.0     |
| ECJ-3(51)   | Shallow Bedrock      | -                                       | 15.0        | ND          | 12.0      | 0.6         | -           | -           | -         | ND          | -           |
| ECJ-3(91)   | Shallow Bedrock      | -                                       | ND          | 1.0         | ND        | 1.1         | -           | -           | -         | ND          | -           |
| ECJ-3(126)  | Intermediate Bedrock | -                                       | ND          | 1.0         | 0.9       | 1.2         | -           | -           | -         | ND          | -           |
| ECJ-3(146)  | Intermediate Bedrock | -                                       | -           | -           | ND        | ND          | -           | -           | -         | ND          | -           |
| MW-2        | Shallow Bedrock      | 3440.0                                  | 2181.0      | 905.0       | 1139.0    | 963.0       | 1003.0      | 1162.5      | 1256.6    | 1205.3      | 1348.9      |
| MW-12       | Shallow Bedrock      | 106.1                                   | -           | -           | -         | -           | -           | -           | -         | -           | -           |
| MW-13       | Shallow Bedrock      | 991.6                                   | 7.1         | 2.1         | 13.1      | 26.9        | -           | -           | -         | 10.5        | -           |
| MW-17       | Shallow Bedrock      | 36.4                                    | 1.2         | 20.2        | 18.4      | 28.8        | -           | -           | -         | 0.6         | -           |
| MW-24       | Shallow Bedrock      | 3843.3                                  | 6530.0      | 3480.0      | 6370.0    | 6040.0      | 4600.0      | 3145.0      | 6052.0    | 5600.0      | 3640.0      |
| GCA-1       | Shallow Bedrock      | 13946.0                                 | 172.9       | 229.6       | 321.9     | 284.5       | 960.0       | 300.7       | 822.3     | 1054.0      | 269.1       |
| MW-4        | Shallow Bedrock      | 1271.9                                  | 1034.2      | 1113.2      | 1149.0    | 753.9       | 1260.0      | 1193.0      | 1393.0    | 1078.0      | 912.4       |
| MW-5        | Shallow Bedrock      | ND                                      | 6.8         | 3.6         | 3.9       | 3.6         | -           | -           | -         | 2.0         | -           |
| MW-6        | Shallow Bedrock      | 4837.2                                  | 2950.0      | 3998.0      | 2137.0    | 4533.0      | 4728.0      | 6081.0      | 9469.0    | 6100.0      | 4000.0      |

**Notes**

- = Not sampled

ND = Not detected above detection limits

**Table A3-3**  
**Sullivan's Ledge Superfund Site**  
**Collection Trench Summary**

|                          | Date of Quarterly Monitoring Event |           |           |           |           |           |          |           |           |           |           |
|--------------------------|------------------------------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|
|                          | 12/29/1999                         | 1/27/2000 | 6/29/2000 | 3/21/2001 | 9/24/2001 | 12/6/2001 | 4/9/2002 | 6/20/2002 | 9/18/2002 | 12/5/2002 | 3/18/2003 |
| <b>Total VOCs (ug/L)</b> | 310                                | 448       | 347       | 182       | NS        | 216.9     | 723      | 247       | 333       | 227       | 131       |

**Notes**

NS = Extraction well not sampled.

VOC = Volatile Organic Compound

Total VOC calculated by summing only detected concentrations of contaminants.

**ATTACHMENT 4**  
**APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)**

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>                                      | <b>Status<br/>(from ROD)</b>                      | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>   |
|---|---|---|---|---|
| Safe Drinking Water Act Regulations, 40 CFR Part 141, Subpart B | ROD: waived                                       | Establishes MCLs for public drinking water supplies. These relevant and appropriate regulations will be waived because of technical impracticability.   | Not provided in ROD                                     | These regulations were waived in the ROD.   |
| TSCA PCB Disposal Requirements, 40 CFR 761.60                   | ROD: applicable, some requirements will be waived | Disposal of soils and sediments with PCBs over 50 ppm, must be by incinerator or equivalent alternative method, or chemical waste landfill. Remedy will result in chemical waste landfill containing existing wastes which have been previously landfilled on site and solidified soils and sediments. Some requirements of chemical waste landfill which are not necessary to protect against risk of injury to health or environment will be waived under the waiver provisions of the TSCA regulations.  | Not provided in ROD                                     | The requirements of 40 CFR 761.75(b)(4-9) were met during remedy construction. Other requirements of chemical waste landfills were waived in the ROD.   |
| RCRA Land Disposal Regulations, 40 CFR 268 Subpart C            | ROD: not applicable                               | These regulations are not applicable because solidified soils are not expected to contain characteristic or listed hazardous waste.   | Not provided in ROD                                     | These regulations are not applicable because pre-design studies (TCLP metals analyses) showed that soil and sediment, representative of material that was excavated, did not exhibit the toxicity characteristics and therefore did not constitute a hazardous waste. |
| RCRA Minimum Technology Regulations, 40 CFR 264.300             | ROD: not applicable                               | These regulations establish standards for new or replacement landfills, or lateral expansions of landfills, including double liner and leachate collection. Not applicable because remedy does not involve creation of new or replacement landfill, or lateral expansion of landfill. Double liners are not relevant and appropriate because it is technically infeasible to construct a double liner separating wastes in quarry pits from the groundwater. Remedy will comply with leachate collection requirements, except inappropriate length of operation requirements. | Not provided in ROD                                     | It should be noted that numerous amendments have been made to these regulations since June 28, 1989. The remedy remains protective because the groundwater treatment plant continues to collect and treat groundwater and leachate collected.                         |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>  | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|---|------------------------------|---|---|--|
| Surface Water Discharge Regulations, 40 CFR 122, promulgated pursuant to Clean Water Act                          | ROD:<br>applicable           | Applicable to discharge of groundwater treatment system effluent. If effluent is discharged to surface waters, regulations will be attained through compliance with state water quality standards, and monitoring of discharge.   | Not provided in ROD                                     | The groundwater treatment system effluent is discharged to the POTW. The discharge contemplated in the ROD is no longer necessary. Therefore the remedy remains protective.  |
| Pretreatment Regulations for Indirect Discharges to POTWs, 40 CFR Part 403  | ROD:<br>applicable           | These regulations control the discharge of pollutants into POTWs, including specific and general prohibitions. If groundwater from passive collection system is discharged to sewer after New Bedford secondary treatment plant becomes operational, these regulations will be applicable, and the remedy will comply through pretreatment. | Not provided in ROD                                     | Numerous amendments have been made to these regulations since June 28, 1989. Changes to the regulations do not impact the protectiveness of the remedy because the GWTP is complying with the local sewer use ordinance which complies with the regulations. |
| Discharge of Dredged and Fill Materials Regulations, 40 CFR 230, promulgated under Section 404 of Clean Water Act | ROD:<br>applicable           | This regulation applies to the use of fill material in stream and wetlands. Remedy will comply because there is no practicable alternative having a less adverse impact on aquatic organisms, and steps will be taken to minimize adverse impacts, such as sedimentation basins, baffles and stream and                                     | Not provided in ROD                                     | There are no impacts to the protectiveness of the remedy. These requirements were applicable during remedy construction but are no longer part of any action contemplated during operation and maintenance of the site.                                      |
| National Ambient Air Quality Standards (NAAQS), 40 CFR 50.6, promulgated pursuant to Clean Air Act                | ROD:<br>applicable           | These applicable regulations set primary and secondary 24-hour concentrations for emissions of particulate matter. Fugitive dust from excavation, treatment, solidification and disposal will be maintained below these standards, by dust suppressants if necessary.   | Not provided in ROD                                     | These requirements remain applicable if further land disturbing activities are conducted. No major activities of this kind are currently anticipated.  |
| OSHA Worker Safety Regulations, 29 CFR Part 1910  | ROD:<br>applicable           | These applicable regulations contain safety and health standards that will be met during all remedial activities, including construction of the cap and installation of groundwater wells.  | Not provided in ROD                                     | OSHA rules remain ARARs as they are worker safety rules that must always be complied with during operation and maintenance of facilities on-site that are still contaminated with hazardous substances; for instance the groundwater treatment facility.     |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b>  | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|--|-------------------------------|---|---|--|
| Department of Transportation Regulations for Transport of Hazardous Materials, 49 CFR Parts 107, 171.1 - 172.558 | ROD: applicable               | Requirements for transporting hazardous materials off-site will be met.   | Not provided in ROD                                     | EPA considers DOT rules as ARARs as they must always be complied with for all off-site shipments.  |
| Massachusetts Drinking Water Regulations (310 CMR 22.00)   | ROD: waived                   | Establishes maximum contaminant levels for public drinking water supplies. Attainment of this relevant and appropriate regulation will be waived because of technical impracticability.   | Not provided in ROD                                     | These regulations were waived in the ROD.  |
| Massachusetts Groundwater Quality Standards (314 CMR 6.00)   | ROD: waived                   | Establishes minimum groundwater criteria. Attainment of this relevant and appropriate regulation will be waived because of technical impracticability.  | Not provided in ROD                                     | These regulations were waived in the ROD.  |
| Massachusetts Hazardous Waste Closure and Post Closure Regulations, 310 CMR 30.580 and 30.590                    | ROD: relevant and appropriate | The closure and post closure regulations are relevant and appropriate. The cap will be constructed and maintained and monitoring will be performed in compliance with these requirements.   | Not provided in ROD                                     | The closure and post closure regulations are applicable and maintenance and monitoring are being performed in accordance with the Site Operations and Maintenance Manual. A Site Closure Plan was developed in compliance with 310 CMR 30.580. |
| Massachusetts Hazardous Waste Location Regulations, 310 CMR 30.700   | ROD: relevant and appropriate | The cap will be constructed outside the 100-year floodplain in accordance with these relevant and appropriate regulations.  | Not provided in ROD                                     | These location requirements were met during construction. The culverts beneath Hathaway Road were augmented to carry the potential flood from the 100-yr storm away from the cap.  |
| Massachusetts Hazardous Waste Groundwater Protection Regulations, 310 CMR 30.660                                 | ROD: relevant and appropriate | The groundwater monitoring requirements are relevant and appropriate. Semi-annual monitoring for specified indicators of hazardous constituents are required to verify the effectiveness of closure. The remedy will comply with the substantive requirements, except that monitoring will be quarterly for the first three years and the frequency will be reevaluated thereafter. | Not provided in ROD                                     | Groundwater monitoring is being conducted on a quarterly basis in accordance with the Post-Construction Environmental Monitoring Plan.   |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>  | <b>Status<br/>(from ROD)</b>     | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|---|----------------------------------|---|---|--|
| Massachusetts Hazardous Waste Landfill Regulations, 310 CMR 30.620                              | ROD:<br>relevant and appropriate | Landfill requirements include double liners, leachate collection systems, and technical requirements for cap. Double liner requirements are not appropriate to this site, since groundwater below landfill will remain contaminated. Other requirements are relevant and appropriate and will be attained, except that leachate collection may be terminated prior to 30 years after closure, if target levels for the passive system have been achieved. | Not provided in ROD                                     | The requirement for post-closure care is relevant and appropriate and is on-going in accordance with the Site Operation and Maintenance Manual.                                    |
| Massachusetts Supplemental Requirements for Hazardous Waste Management Facilities, 314 CMR 8.00 | ROD:<br>applicable               | RCRA facilities subject to surface water discharge requirements must also comply with DEQE regulations regarding location, technical standards for landfills, closure and post-closure, and management standards.   | Not provided in ROD                                     | The groundwater treatment plant discharges to the New Bedford POTW, not to surface water. As a result, surface waters are not impacted by a discharge at the site.                 |
| Massachusetts Surface Water Quality Standards, 314 CMR 4.00                                     | ROD:<br>applicable               | Surface waters must be free from pollutants which are present in toxic amounts, which exceed recommended limits for most sensitive use, or which exceed safe exposure levels. These applicable standards will be attained during remedial design and operation of the treatment system.   | Not provided in ROD                                     | As constructed, the groundwater treatment plant discharges to the New Bedford POTW, not to surface water. As a result, surface waters are not impacted by a discharge at the Site. |



**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>                                   | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>   | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>   |
|--|------------------------------|--|---|---|
| Massachusetts Wetlands Protection Regulations, 310 CMR 10.00 | ROD:<br>applicable           | This applicable regulation sets performance standards for dredging banks, vegetated wetlands, and lands under water. The remedy and mitigative measures will attain these standards. | Not provided in ROD                                     | The soil and sediment excavation and stream lining were conducted so that adverse effects were minimized. Erosion control measures were used throughout remedy construction. A Wetlands Restoration Plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually, for a period of at least five years. Long-term wetland monitoring will then be conducted to insure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |
| Massachusetts Ambient Air Quality Standards, 310 CMR 6.00    | ROD:<br>applicable           | This applicable regulation sets primary and secondary standards for emissions of particulate matter. These standards will be met during implementation.                              | Not provided in ROD                                     | These requirements were met during remedy construction activities.  |
| Massachusetts Right to Know Regulations, 454 CMR 21.000      | ROD:<br>applicable           | Informational requirements of these regulations will be attained during implementation.  | Not provided in ROD                                     | Requirements were met during the remedial action through extensive outreach activities. Outreach will be conducted going forward.   |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>        | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|-----------------------------------|------------------------------|---|---|--|
| Executive Orders 11990 and 11988  | ROD: To be considered        | These executive orders regarding protection of floodplains and wetlands were considered in the evaluation and development of remedial alternatives. The soil and sediment excavation and stream lining will be conducted in such a manner to avoid or minimize adverse impacts. | Not provided in ROD                                     | The requirements to avoid or minimize adverse impacts to wetlands were met during remedy construction. A Wetlands Restoration Plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually. Long-term wetland monitoring will then be conducted to ensure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |
| Interim Sediment Quality Criteria | ROD: To be considered        | Interim sediment quality criteria were considered in establishing target levels for cleanup of sediments.   | Not provided in ROD                                     | Although the Interim Sediment Quality Criterion for PCBs was never finalized, the technical basis for sediment quality criteria for non-ionic organic contaminants such as PCBs remains a scientifically defensible approach to settling sediment quality criteria for PCBs. These criteria were considered in the development of cleanup standards for the site.  |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>  | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b> | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|---|------------------------------|--|---|--|
| Massachusetts Solid Waste Management Regulations, 310 CMR 19.117    | ROD: not provided in ROD     | Not provided in ROD                        | Not provided in ROD                                     | Considered applicable due to the detection of landfill gas at perimeter monitoring wells at concentrations greater than 25% LEL. The provisions of this regulation mandate the control of landfill gases to concentrations less than 25% LEL to prevent public health and safety concerns. Although this regulation was not included in the ROD, it provides a mechanism to measure the performance of landfill gas generation at the site. Other ARARs listed do not provide such a mechanism. A process is in place to comply with the regulation. Pilot testing has been performed to support the full scale design and implementation of a landfill gas collection system. The performance of this system in controlling landfill gas migration should be assessed in the next Five-Year Review. |
| Massachusetts Solid Waste Management Regulations; 310 CMR 19.118(4) | ROD: not provided in ROD     | not provided in ROD                        | not provided in ROD                                     | Considered applicable; requires the installation of gas monitoring landfills to monitor the possible migration of explosive gases.   |

**TABLE A4-1. REVIEW OF ARARS FOR OPERABLE UNIT 1  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>                               | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b> | <b>Five-Year Review</b>  |
|--|------------------------------|--|---|--|
| Massachusetts Solid Waste Management Regulations, 310 CMR 19.132 (4) | ROD: not provided in ROD     | Not provided in ROD  | Not provided in ROD                                     | Considered applicable due to the detection of landfill gas at perimeter monitoring wells at concentrations greater than 25% LEL. The provisions of this regulation require the DEP to be notified when concentrations of landfill gas are measured above 25% LEL at the property boundary. Although this requirement was not included in the ROD, it has been added because other ARARs listed do not provide a requirement to notify the DEP under such conditions, which is an appropriate means to maintain public health and safety. |
| Massachusetts Solid Waste Management Regulations, 310 CMR 19.150     | ROD: not provided in ROD     | Not provided in ROD  | Not provided in ROD                                     | Considered applicable due to the detection of landfill gas at property boundaries at concentrations greater than 25% LEL. Although this requirement was not included in the ROD, it was added because it provides a method to address the landfill gas concentrations above 25% LEL, and is referenced in 310 CMR 19.132(4).   |
| Massachusetts Air Pollution Control Regulations, 310 CMR 7.00        | ROD: applicable              | Applicable to emissions of particulates during implementation of remedy. | Not provided in ROD                                     | The emission of particulates during remedy construction was addressed. In accordance with the Corrective Action Design dated November 15, 2002 (O'Brien & Gere), a pilot E131gas extraction and discharge system is operating at the site. 310 CMR 7.00 is applicable to the discharge of emissions. A full scale landfill gas collection system is required, and will be constructed. Compliance with this regulation should be assessed in the next Five-Year Review.  |

**TABLE A4-2. REVIEW OF LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| Medium/Authority<br>(from ROD)  | ARAR<br>(from ROD)   | Status<br>(from ROD) | Requirement Synopsis<br>(from ROD)  | Action to be Taken to Attain ARAR<br>(from ROD)   | Five-Year Review   |
|---------------------------------|--|----------------------|---|---|--|
| Federal Regulatory Requirements | Clean Water Act (CWA) Guidelines for Disposal of Dredged or Fill Material (33 U.S.C. 1344) (40 CFR Part 230) | ROD:<br>Applicable   | No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the discharge which would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Appropriate and practicable steps must be taken which will minimize the potential adverse impacts of the discharge of the dredged material on the aquatic ecosystem.   | Any activities that involve the discharge of dredge or fill materials in wetlands shall be conducted in a manner utilizing the alternative which would have the least adverse impact on the aquatic ecosystem and the environment, pursuant to 40 CFR 230.10(a).  | This requirement was met during remedy construction. The discharge of fill materials in wetlands was conducted to have the least adverse impact on the aquatic ecosystem and the environment. Fill materials were obtained from off-site. Soils used as fill were tested to demonstrate that they met wetland soil requirements and had less than 1 mg/kg total PCBs.  |
|                                 | Statement of Procedures on Floodplain Management and Wetlands Protection (40 CFR 6, App. A)                  | ROD:<br>Applicable   | Federal agencies shall avoid, wherever possible, the long and short term impacts associated with the destruction of wetlands and the occupancy and modifications of floodplains and wetlands development wherever there is a practicable alternative in accordance with Executive Orders 11990 and 11988. The agency shall promote the preservation and restoration of floodplains so that their natural and beneficial values can be realized. Any plans for actions in wetlands or floodplains must be submitted for public review. | All practicable means will be used to minimize harm to wetlands and floodplains. Wetlands and floodplains disturbed by excavation will be restored to their original conditions.  | Remedial construction was conducted so that impacts to wetlands were minimized. Erosion control measures were used throughout construction. A wetlands restoration plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually, for a period of at least five years. Long-term wetland monitoring will then be conducted to ensure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |
|                                 | Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)   | ROD:<br>Applicable   | Under 662, any modification of a body of water requires consultation with the U.S. Fish and Wildlife Services, to develop measures to prevent, mitigate, or compensate for losses to fish and wildlife. This requirement is addressed under CWA Section 404 requirements.   | During the identification, screening, and evaluation of alternatives, the effects on wetlands are evaluated. If an alternative modifies a body of water, EPA must consult the U.S. Fish and Wildlife Service. Whenever possible, the remedial alternative describes measures to prevent, mitigate, or compensate for losses to fish and wildlife. | This requirement was met during remedy construction. U.S. Fish and Wildlife Service was consulted.   |

**TABLE A4-2. REVIEW OF LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| Medium/Authority<br>(from ROD)   | ARAR<br>(from ROD)  | Status<br>(from ROD)                   | Requirement Synopsis<br>(from ROD)   | Action to be Taken to Attain ARAR<br>(from ROD)  | Five-Year Review   |
|----------------------------------|---|--|--|--|--|
| State Regulatory<br>Requirements | RCRA Location<br>Standards (40 CFR<br>264.18)   | ROD:<br>Relevant<br>and<br>Appropriate | This regulation outlines the requirements for constructing a RCRA facility on a 100-year floodplain.   | A RCRA facility that is located on a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless waste may be removed safely before floodwater can reach the facility of no adverse effects on human health and the environment would result if washout occurred.  | No facility has been constructed within OU2. If a facility is proposed, it must be approved in accordance with this regulation.  |
|                                  | Hazardous Waste<br>Facility Siting<br>Regulations (990 CMR<br>1.00)   | ROD:<br>Relevant<br>and<br>Appropriate | These regulations outline the criteria for the construction, operation, and maintenance of a new facility or increase in an existing facility for the storage, treatment, or disposal of hazardous waste.  | No portion of the facility may be located within a wetland or bordering a vegetated wetland, or within a 100-year floodplain, unless approved by the state.  | These regulations are not applicable since no facility has been constructed within OU2.  |
|                                  | Massachusetts<br>Wetlands Protection<br>Act (M.G.L. 131, §40);<br>Massachusetts<br>Wetlands Protection<br>Regulations (310 CMR<br>§10.00)                             | ROD:<br>Applicable                     | These regulations are promulgated under Wetlands Protection Laws, which regulate dredging, filling, altering, polluting of inland wetlands. Work within 100 feet of a wetland is regulated under this requirement. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Each remedial alternative will be evaluated for its ability to attain regulatory performance standards, including mitigation of impacted wetlands. | If alternatives involve removing, filling, dredging, or altering a DEP-defined wetland, or conducting work within 100 feet of a wetland, it must be demonstrated that the modifications are not significant to the wetland or that the proposed work will contribute to the protection of the wetland. Whenever possible, remedial actions will be conducted so that impacts to wetlands will be minimized or mitigated. | Remedial construction was conducted so that impacts to wetlands were minimized. Erosion control measures were used throughout construction. A wetlands restoration plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually, for a period of at least five years. Long-term wetland monitoring will then be conducted to ensure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |
|                                  | Massachusetts<br>Endangered Species<br>Act (M.G.L. ch. 131,<br>§40); Massachusetts<br>Endangered Species<br>Act Regulations, Part<br>III (321 CMR §§10.30 -<br>10.43) | ROD:<br>Applicable                     | These regulations established Massachusetts' list of threatened and endangered species and species of special concern. The habitat of any species listed under this requirement is protected by the regulations promulgated under the MA Wetlands Protection Act.  | If alternatives involve impacts to the habitat of any listed species, appropriate actions must be taken during remediation to mitigate or minimize impacts to the species and its critical habitat. Habitats of any listed species will be identified prior to remediation.  | This requirement was met during remedial design and construction. The Mystic Valley amphipod was identified as a species of special concern at the site, and measures were taken to minimize impacts to the species and its critical habitat.  |

**TABLE A4-2. REVIEW OF LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>Medium/Authority<br/>(from ROD)</b>                  | <b>ARAR<br/>(from ROD)</b>  | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>   | <b>Five-Year Review</b>   |
|---|---|------------------------------|---|---|---|
| State Nonregulatory<br>Requirements to be<br>Considered | Massachusetts<br>Wetlands Protection<br>Policy 90-2; Standards<br>and Procedures for<br>Determining Adverse<br>Impacts to Rare<br>Species | ROD: To<br>be<br>Considered  | This policy clarifies the rules regarding rare<br>species habitat contained at 310 CMR 10.59. | Habitats of rare species, as<br>determined by the Massachusetts<br>Natural Heritage Program, will be<br>considered in the mitigation plans. | This requirement was met during<br>remedial design and construction.<br>The Mystic Valley amphipod was<br>identified as a species of special<br>concern at the site, and was<br>considered in the site mitigation<br>plans. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>   | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>  | <b>Five-Year Review</b>   |
|--|------------------------------|--|--|---|
| National Pollution Discharge Elimination System (NPDES) (40 CFR 122 and 125) | ROD:<br>Applicable           | Regulates the discharge of water into public surface waters.   | Discharged water will be monitored for the required pollutants and standards will be met.  | No water was discharged to surface waters during construction. Instead, construction water was treated and discharged to the New Bedford POTW in accordance with pretreatment program requirements. |
| Toxic Pollutant Effluent Standards (40 CFR 129)                              | ROD:<br>Applicable           | Regulates the discharge of the following pollutants: aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, and PCBs.   | All discharge waters will be monitored for the regulated pollutants and will meet standards.   | No water was discharged to surface waters during construction. Instead, construction water was treated and discharged to the New Bedford POTW in accordance with pretreatment program requirements. |
| Massachusetts Surface Water Quality Standards 314 CMR 4.00                   | ROD:<br>Applicable           | These standards designate the most sensitive uses for which the various waters of the Commonwealth shall be enhanced, maintained and protected. Minimum water quality criteria required to sustain the designated uses are established. Federal AWQC are to be considered in determining effluent discharge limits. Where recommended limits are not available, site-specific limits shall be developed. Any on-site water treatment and discharge is subject to these requirements. | Water from the dewatering process will be discharged directly to the unnamed stream. If this water does not meet state standards, it will be treated prior to discharge. Effluent limitations for water discharges will be established so that such discharges shall not result in a violation of state water quality standards. | No water was discharged to surface waters during construction. Instead, construction water was treated and discharged to the New Bedford POTW in accordance with pretreatment program requirements. |



**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>          | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>   | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>  | <b>Five-Year Review</b>   |
|-------------------------------------|------------------------------|--|--|---|
| Clean Water Act 404<br>(40 CFR 230) | ROD:<br>Applicable           | No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the discharge which would have a less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Appropriate and practicable steps must be taken which will minimize the potential adverse impacts of the discharge material on the aquatic ecosystem. | <p><b>Selected Remedy:</b> Any activities that involve the discharge of dredge or fill materials in wetlands shall be conducted in a manner utilizing the alternative which would have the least adverse impact on the aquatic ecosystem and the environment, pursuant to 40 CFR 230.10(a), and any excavated areas to be filled shall be filled with clean materials from off-site, in accordance with 40 CFR 230.</p> <p><b>Contingency Remedy:</b> Any activities that involve the discharge of dredge or fill materials in wetlands shall be conducted in a manner utilizing the alternative which would have the least adverse impact on the aquatic ecosystem and the environment, pursuant to 40 CFR 230.10(a), and any excavated areas to be filled shall be filled with adequately treated and appropriately reconditioned materials.</p> | This requirement was met during remedy construction. The discharge of fill materials in wetlands was conducted to have the least adverse impact on the aquatic ecosystem and the environment. Fill materials were obtained from off-site. Soils used as fill were tested to demonstrate that they met wetland soil requirements and had less than 1 mg/kg total PCBs. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>  | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>   | <b>Five-Year Review</b>  |
|---|------------------------------|---|---|--|
| Procedures on<br>Floodplain<br>Management and<br>Wetlands Protection<br>(40 CFR 6, App A) | ROD:<br>Applicable           | Federal agencies shall avoid, wherever possible, the long and short term impacts associated with the destruction of wetlands and the occupancy and modifications of floodplains and wetlands development wherever there is a practicable alternative in accordance with Executive Orders 11990 and 11988. The agency shall promote the preservation and restoration of floodplains so that their natural and beneficial values can be realized. Any plans for actions in wetlands or floodplains must be submitted for public review. | This alternative will take into consideration this statement. All practicable means will be used to minimize harm to wetlands and floodplains. Wetlands and floodplains disturbed by excavation will be restored to their original conditions. Temporary fill placed in the golf course and wetland for access roads and staging area will not have a significant impact on the extent of flooding. Culverts will be placed under the access roads to allow for undiverted passage of flood waters. | Remedial construction was conducted so that impacts to wetlands were minimized. Erosion control measures were used throughout construction. A wetlands restoration plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually, for a period of at least five years. Long-term wetland monitoring will then be conducted to ensure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |
| Massachusetts<br>Wetlands Protection<br>Act (M.G.L. 131, §40)<br>(310 CMR 10.00)          | ROD:<br>Applicable           | The dredging, filling, altering, or polluting of inland wetlands and work within 100 feet of a wetland is regulated. Each remedial alternative will be evaluated for its ability to attain regulatory performance standards, including mitigation of impacted wetlands.   | Wetlands disturbed by excavation will be restored to original conditions. All practicable means will be used to minimize wetland disturbance. Remedial activities will be selected based on the ability to minimize adverse effects on such habitats.   | Remedial construction was conducted so that impacts to wetlands were minimized. Erosion control measures were used throughout construction. A wetlands restoration plan was prepared which outlined measures to attain these standards. Post-construction wetland monitoring is being conducted annually, for a period of at least five years. Long-term wetland monitoring will then be conducted to ensure the long-term effectiveness of the wetland restoration program. A Wetlands Monitoring Report was completed in March 2002 that summarized maintenance and monitoring performed during 2001 within wetlands restoration areas of OU1 and OU2. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>   | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>   | <b>Five-Year Review</b>   |
|--|------------------------------|--|---|---|
| Massachusetts<br>Endangered Wildlife<br>and Wild Plants<br>Regulations (321 CMR<br>8.00)                                 | ROD:<br>Applicable           | These regulations established Massachusetts' list of threatened and endangered species and species of special concern. The habitat of any species listed under this requirement is protected by the regulations promulgated under the Massachusetts Wetlands Protection Act. | If the alternative involves impact to the habitat of any listed species, appropriate actions must be taken during remediation to mitigate or minimize impacts to the species and its critical habitat. Habitats of any listed species will be identified prior to remediation.                            | This requirement was met during remedial design and construction. The Mystic Valley amphipod was identified as a species of special concern at the site, and actions were taken to mitigate or minimize impacts to the species and critical habitat.  |
| Massachusetts<br>Certification for<br>Dredging, Dredged<br>Material Disposal, and<br>Filling in Waters (314<br>CMR 9.00) | ROD:<br>Applicable           | The substantive portions of these regulations establish criteria and standards for the dredging, handling and disposal of fill material and dredged material.  | Excavation, filling, and disposal operations will meet substantive criteria and standards in these regulations. The remedial alternative will be designed to ensure the maintenance or attainment of the MA Water Quality Standards in the affected waters and to minimize the impact on the environment. | This requirement was met during remedy construction. The discharge of fill materials in wetlands was conducted to have the least adverse impact on the aquatic ecosystem and the environment. Fill materials were obtained from off-site. Soils used as fill were tested to demonstrate that they met wetland soil requirements and had less than 1 mg/kg total PCBs. |
| Fish and Wildlife<br>Coordination Act (16<br>U.S.C. 166 et seq.)   | ROD:<br>Applicable           | Any modification of a body of water requires prior consultation with the U.S. FWS to develop measures to prevent, mitigate, or compensate for losses to fish and wildlife.   | Prior to excavation, EPA will consult with U.S. FWS. This alternative includes measures to prevent, mitigate, or compensate for losses to fish and wildlife.  | This requirement was met during remedy construction. U.S. Fish and Wildlife Service was consulted.  |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| ARAR<br>(from ROD)   | Status<br>(from ROD)   | Requirement Synopsis<br>(from ROD)   | Action to be Taken to Attain ARAR<br>(from ROD)  | Five-Year Review  |
|--|--|--|--|---|
| TSCA, Subpart D,<br>Storage and Disposal<br>(40 CFR 761.60,<br>761.65, 761.79) | ROD:<br>Applicable if<br>PCB<br>concentrations<br>are >50 ppm;<br>Relevant and<br>appropriate if<br>PCB<br>concentrations<br>are <50 ppm | All dredged materials that contain PCBs at concentrations of 50 ppm or greater shall be disposed of in an incinerator or in a chemical waste landfill or, upon application, using a disposal method to be approved by the EPA Region in which the PCBs are located. On-site storage facilities for PCBs shall meet, at a minimum, the following criteria:<br><br><ul style="list-style-type: none"> <li>• Adequate roof and walls to prevent rain</li> <li>• Adequate floor with continuous curbing</li> <li>• No openings that would permit liquids to flow from curbed area</li> <li>• Not located at a site that is below the 100-year flood water elevation</li> </ul> | <b>Selected Remedy:</b> Disposal of soils/sediments under the cap at the Disposal Area will comply with comply with chemical waste landfill requirements except requirements waived in the ROD for the First Operable Unit. These regulations will be considered by U.S. EPA Region I in the selection of this alternative and in the design of storage facilities.<br><br>Solid debris, excluding trees and bushes, shall be decontaminated prior to off-site transport or off-site disposal in accordance with 40 CFR 761.79; storage facilities shall be designed consistent with 40 CFR 761.65(b)(a)(i), (ii), and (iii).<br><br><b>Contingency Remedy:</b> These regulations will be considered by U.S. EPA Region I in the selection of this alternative and in the design of storage facilities. Solid debris, excluding trees and bushes, shall be decontaminated prior to off-site transport or off-site disposal in accordance with 40 CFR 761.79; storage facilities shall be designed consistent with 40 CFR 761.65(b)(a)(i), (ii), and (iii). PCB-concentrated waste oils from the solvent extraction process will be disposed of in accordance with these regulations. | This requirement was met during remedy construction. None of the soils handled during OU2 remedial actions exceeded the 50 ppm level for PCBs. No off-site treatment or disposal of solid debris was required during construction. The contingency remedy identified in the ROD was not utilized. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b>   | <b>Requirement Synopsis<br/>(from ROD)</b>   | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>  | <b>Five-Year Review</b>   |
|--|--|--|--|---|
| Massachusetts Supplemental Requirements for Hazardous Waste Management Facilities (314 CMR 8.00) | ROD: Relevant and Appropriate  | Water treatment units which are exempted from M.G.L.c.21C and which treat, store, or dispose of hazardous wastes generated at the same site are regulated to ensure that such activities are conducted in a manner which protects public health and safety and the environment.  | If treatment of sediment/soil dewatering water is necessary, all process will comply with Massachusetts requirements regarding location, technical standards, closure and post-closure, and management standards.  | Temporary treatment of sediment dewatering water during remedial actions complied with Massachusetts regulations.   |
| Massachusetts Hazardous Waste Regulations 310 CMR 30.000)  | ROD: Applicable if sediments/soils are defined as hazardous waste under Mass. Law; relevant and appropriate if sediments/soils are similar to hazardous wastes; For contingency remedy, applicable to PCB-concentrated waste oil | Regulate the generation, storage, collection, transport, treatment, disposal, use, reuse, and recycling of hazardous waste in Massachusetts. The regulations provide procedural standards for the following: generators (310 CMR 30.300), general management standards for all facilities (301 CMR 30.510), contingency plan, emergency procedures, preparedness, and prevention (314 CMR 30.520), manifest system (310 CMR 30.530), closure and post-closure (310 CMR 30.580), landfill requirements (310 CMR 30.620), protection (310 CMR 30.660), use and management of containers (310 CMR 30.680), and facility location standards and land disposal restrictions (310 CMR 30.700). | <b>Selected and Contingency Remedies:</b> Based on known information, EPA expects that the sediment/soil are not hazardous waste under Massachusetts law. However, if the sediment/soil is designated hazardous waste under Massachusetts law, all processes involving the contaminated sediment/soil will be conducted in accordance with state hazardous waste regulations.<br><b>Contingency Remedy:</b> All processes involving the PCB-concentrated waste oil will be conducted in accordance with these regulations. | Post-closure requirements are being addressed by OU1. The contingency remedy identified in the ROD was not utilized.  |
| RCRA, Land Disposal Regulations (40 CFR 268, Subpart C)  | ROD: Applicable if the sediments/soil are characteristic of hazardous waste under federal law  | Prohibits the disposal of RCRA hazardous waste in the land unless treatment standards are met or treatability variance is obtained.  | Based on known information, EPA expects that the sediment/soil are not hazardous waste. However, if the sediment/soil is hazardous waste due to the presence of metals, it will be solidified to render it non-hazardous or, alternatively, to meet the treatability variance requirements in the land disposal requirements.  | These regulations are not applicable because pre-design studies (TCLP metals analyses) conducted for OU1 showed that soil and sediment, representative of material that was excavated, did not exhibit the toxicity characteristics and therefore did not constitute a hazardous waste. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| ARAR<br>(from ROD)  | Status<br>(from ROD)          | Requirement Synopsis<br>(from ROD)   | Action to be Taken to Attain ARAR<br>(from ROD)   | Five-Year Review   |
|---|-------------------------------|--|---|--|
| National Ambient Air Quality Standards (NAAQS), 40 CFR 50.6, promulgated pursuant to Clean Air Act                            | ROD:<br>Applicable            | The maximum primary and secondary 24-hr. concentration for particulate emissions from site excavation activities must be maintained below 150 ug/m <sup>3</sup> , 24-hour average for particulates having a mean diameter of 10 micrometers or less. The annual standard is 50 ug/m <sup>3</sup> , annual arithmetic mean.   | The ambient air will be continuously monitored to ensure compliance with federal regulations.   | Particulate monitoring was conducted and dust suppressants were used when necessary to control fugitive dust. These requirements are applicable during construction if further land disturbing activities are conducted.   |
| Massachusetts Ambient Air Quality Standards (310 CMR 6.00) and Massachusetts Air Pollution Control Regulations (310 CMR 7.00) | ROD:<br>Applicable            | <b>Selected Remedy:</b> The applicable portions of these regulations prohibit burning or emissions of dust which causes or contributes to a condition of air pollution.<br><b>Contingency Remedy:</b> All construction and treatment activities will utilize Best Available Control Technology in order to prevent contaminant transfer between other media and air. Massachusetts AALs and TELs are used in determining compliance with these regulations. Burning or emissions of dust which causes or contributes to a condition of air pollution are prohibited. | <b>Selected Remedy:</b> Control measures will be implemented to ensure compliance with state regulations.<br><b>Contingency Remedy:</b> The ambient air will be continuously monitored and control measures shall be implemented to ensure compliance with state regulations. | These requirements were met during remedy construction activities. The contingency remedy identified in the ROD was not utilized.  |
| Federal Noise Control Act (40 CFR 204, 205, 211)  | ROD: Relevant and Appropriate | Regulates construction and transportation equipment noise, process equipment and noise levels, and noise levels at the property boundaries of the project.   | Site noise levels will be in accordance with federal requirements.  | These requirements were met during remedy construction.  |
| Toxic Substance Control Act (TSCA), Subpart G, PCB Spill Clean-up Policy (40 CFR 761.120-135)                                 | ROD: To be considered         | Sets cleanup levels for PCB spills of 50 ppm or greater at 10 ppm for non-restricted access areas, and 25 ppm for restricted access areas.   | Cleanup levels established in Chapter Six of the Feasibility Study are consistent with this policy.   | The requirements were met during remedy construction. Soils and sediment sampling is being conducted as part of post-construction environmental monitoring to verify continued compliance with the cleanup levels.   |
| Interim Sediment Quality Criteria   | ROD: To be considered         | These criteria were developed by U.S. EPA for certain hydrophobic organic compounds, including PCBs, to protect benthic organisms. The criteria for PCBs is 19.5 ug PCB/g carbon.  | The cleanup levels developed in Chapter 6 of the Feasibility Study are consistent with interim criteria.  | The Interim Sediment Quality Criterion for PCBs was never finalized. The technical basis for sediment quality criteria for non-ionic organic contaminants such as PCBs remains a scientifically defensible approach to setting sediment quality criteria for PCBs in sediment. |

**TABLE A4-3. REVIEW OF ACTION-SPECIFIC ARARS FOR THE SELECTED AND CONTINGENCY REMEDIES, OPERABLE UNIT 2 (MIDDLE MARSH)  
SULLIVAN'S LEDGE SUPERFUND SITE, NEW BEDFORD, MASSACHUSETTS**

| <b>ARAR<br/>(from ROD)</b>   | <b>Status<br/>(from ROD)</b> | <b>Requirement Synopsis<br/>(from ROD)</b>  | <b>Action to be Taken to Attain ARAR<br/>(from ROD)</b>  | <b>Five-Year Review</b>   |
|--|------------------------------|---|--|---|
| Massachusetts Allowable Ambient Air Limits - Annual (AALs) and Massachusetts Threshold Effects Exposure Levels (TELs)    | ROD: To be considered        | These guidances are to be considered in evaluating whether a condition of air pollution exists. The TEL for PCB is 0.003 ug/m <sup>3</sup> and the AAL is 0.005 ug/m <sup>3</sup> .   | Massachusetts air limits and exposure levels will be considered in the evaluation of emissions monitoring results.   | These requirements were considered during construction.   |
| Guidance on Remedial Actions for Superfund Sites with PCB Contamination  | ROD: To be considered        | Describes various scenarios and considerations pertinent to determining the appropriate level of PCBs that can be left in each contaminated media to achieve protection of human health and the environment.                          | This guidance will be considered in determining the appropriate level of PCBs that will be left in the sediment/soil. Management of PCB-contaminated residuals will be designed in accordance with the guidance.                       | This guidance was considered during remedial design.  |
| EPA Interim Policy for Planning and Implementing CERCLA Response Actions. Proposed Rule, 50 CFR 45933 (November 5, 1985) | ROD: To be considered        | Discusses the need to consider treatment, recycling, and reuse before offsite land disposal is used. Prohibits use of a RCRA facility for offsite management of Superfund hazardous substances if it has significant RCRA violations. | <b>Selected Remedy:</b> This policy will be considered in the treatment of the PCB-contaminated sediment/soil.<br><b>Contingency Remedy:</b> This policy will be considered in the treatment of the PCB-contaminated waste oil stream. | Off-site disposal of PCB-contaminated sediment/soil was not conducted. The contingency remedy identified in the ROD was not utilized. |

**ATTACHMENT 5**  
**SITE INSPECTION DOCUMENTATION**



**Sullivan's Ledge Superfund Site  
Wetlands Restoration Area (OU-1)  
Site No.  
5-Year Review Checklist**

The following checklist was created to review construction of the mitigation wetlands on the north side of Hathaway Road at Sullivan's Ledge Superfund Site in New Bedford, MA. The project goals stated in the Wetlands Restoration Plan (WRP) dated July 1997 were used as a basis for the OU-1 checklist.

|   |     |             |                  |
|---|-----|-------------|------------------|
| <b>I. HYDROLOGY</b>   |     |             |                  |
| Two staff gages were installed in areas outside of the limits of excavation during remediation activities. Are those staff gauges being maintained and monitored and are the results being compared to the results from the gauges within the restored/mitigation areas?  | Yes | No          | Unknown <b>X</b> |
| <b>Comment:</b> The 2002 Wetland Monitoring Report did not specifically compare staff gauge results within the restoration areas to those outside the restoration areas; however, this issue should be addressed by the Contractor in future reports.   |     |             |                  |
| Have the six staff gauges (G-1, G-2, G-3, G-4, G-5, G-6) in OU-1 areas been monitored four times per year – in mid-April, the first week of June, the first week of August, and during the first two weeks of September?  | Yes | No <b>X</b> | Unknown          |
| <b>Comment:</b> The 2002 Wetland Monitoring Report included staff gauge, monitoring well, and piezometer data for three monitoring events (April 3 <sup>rd</sup> , August 29 <sup>th</sup> , October 18 <sup>th</sup> ). Data should have been collected four times during the time-frames listed above and in the Monitoring Plan. Discussions regarding the appropriateness of the specified times are on-going since the hydrology criterion requires that groundwater be within 12 inches of the ground surface for over two weeks of the growing season. If long intervals are allowed between readings, however, no definitive statement as to whether this condition is met can be made. |     |             |                  |
| Have the staff gauge results been compared to baseline data prepared by O'Brien and Gere, 1997, and reported in the annual data reports to USEPA and MADEP?   | Yes | No <b>X</b> | Unknown          |
| <b>Comment:</b> The 2002 Wetland Monitoring Report included a portion of the 1997 piezometer and monitoring well data for both 1997 and 2003. No analysis of the data was provided to illustrate whether the 2002 water elevations are equivalent to the pre-construction conditions. However, the data has been questioned and a response from the Contractor is pending.  |     |             |                  |
| Have the piezometers in OU-1 restored Middle Marsh been monitored four times per year between April and October?  | Yes | No <b>X</b> | Unknown          |
| Have the piezometers within wetland Mitigation Area – East and Mitigation Area – West been monitored four times per year between April and October?   | Yes | No <b>X</b> | Unknown          |

|  |       |      |           |
|--|-------|------|-----------|
| <b>Comment:</b> The 2002 Wetland Monitoring Report included staff gauge, monitoring well, and piezometer data for three monitoring events (April 3 <sup>rd</sup> , August 29 <sup>th</sup> , October 18 <sup>th</sup> ). Data should have been collected four times during the time-frames listed above and in the Monitoring Plan.  |       |      |           |
| Have the piezometer readings been compared to baseline data prepared by O'Brien and Gere, 1997, and reported in the annual data reports to USEPA and MADEP?  | Yes   | No X | Unknown   |
| <b>Comment:</b> Groundwater elevations in wetlands north of Hathaway Road appear to be 0.5 feet to 3.0 feet lower than pre-remediation conditions. The PRPs have not yet analyzed the data to evaluate this difference and the potential impact on the restored wetlands, and areas beyond the excavation area.  |       |      |           |
| Has the long-term goal for the wetland hydrology, namely the presence of groundwater and/or saturated soils within 12 inches of the wetland surface in each piezometer for at least three of the first five years and each fifth year thereafter, been met?  | Yes   | No   | Unknown X |
| <b>Comment:</b> Although the water elevations within the piezometers have been taken and recorded, no reference wetland ground surface elevations have been established, or at least have not been reported to EPA despite requests for the information. The reference wetland ground surface elevations should be the elevation of the level ground surface adjacent to the hummock upon which each piezometer is located. Once this elevation has been established, then a comparison of the groundwater elevation to the surface elevation can be made and whether the hydrology criterion of a successful wetland has been met can be ascertained. |       |      |           |
| <b>Hydrology restored to pre-remediation conditions at:</b>  |       |      |           |
| - Unnamed stream channel?  | Yes   | No   | Unknown X |
| - Mitigation stream channel?   | Yes   | No   | Unknown X |
| - Forested wetland?  | Yes   | No   | Unknown X |
| - Emergent wetland?  | Yes   | No   | Unknown X |
| <b>Comment:</b> No discussion of the restoration of hydrology was included in the 2002 Wetland Monitoring Report. In addition, no baseline data was presented in the 2002 Wetland Monitoring Report for the Unnamed Stream. However, it should be noted that a majority of the 2002 growing season was within a Drought Watch when water elevations would be anticipated to be lower than normal.  |       |      |           |
| <b>II. PERMANENT SAMPLING PLOTS</b>  |       |      |           |
| Has the herbaceous vegetation within the 13 vegetation sampling plots been identified, tallied, and percent cover estimated?   | Yes X | No   | Unknown   |
| <b>Comment:</b> This data was included in the 2002 Wetland Monitoring Report.  |       |      |           |
| Has the plant cover dominance been quantified and recorded for each species within the 13 vegetation sampling plots within OU-1 Middle Marsh in accordance with the standards used in the 1987 Corps of Engineers Manual?  | Yes X | No   | Unknown X |
| <b>Comment:</b> This data was included in the 2002 Wetland Monitoring Report.  |       |      |           |
| Has the woody vegetation within the 13 vegetation sampling plots been identified, including the height, diameter at breast height, and an estimate of percent cover?   | Yes X | No   | Unknown X |

**Comment:** This data was included in the 2002 Wetland Monitoring Report.

|  |       |      |           |
|--|-------|------|-----------|
| Has the percent cover of newly recruited plant species, both native and introduced, been reported?   | Yes X | No   | Unknown   |
| <b>Comment:</b> This data was included in the 2002 Wetland Monitoring Report.  |       |      |           |
| Has the frequency of occurrence and relative cover been calculated using the data from the 13 vegetation sampling plots?   | Yes X | No   | Unknown   |
| <b>Comment:</b> This data was included in the 2002 Wetland Monitoring Report.  |       |      |           |
| Did the OU-1 restoration and mitigation areas achieve and maintained a total 75% areal coverage of wetland plant species by the end of the second growing season?  | Yes   | No   | Unknown X |
| <b>Comment:</b> Since the 5-year review is required prior to the end of the second growing season (2003), it is not possible to discern whether the 75% areal coverage by wetland plants performance standard has been met.  |       |      |           |
| Are a plan and timetable for continued wetland restoration efforts to achieve 75% areal coverage required (i.e. Did the site fail to achieve the 75% areal coverage by the end of the second growing season (2003)?  | Yes   | No   | Unknown X |
| <b>Comment:</b> Since the 5-year review is required prior to the end of the second growing season (2003), it is not possible to discern whether the 75% areal coverage by wetland plants performance standard has been met, and thus whether a plan is required.   |       |      |           |
| Has the percent open water for plots adjacent to the stream and within the OU-1 Ponds been estimated?  | Yes   | No X | Unknown   |
| <b>Comment:</b> The 2002 Wetland Monitoring Report did not include an estimate of the open water within the OU-1 Pond Plot #2, OU-1 Stream Plot #2, or OU-1 Stream Restoration Plot #2; however, an estimate was given for the remaining plots adjacent to the stream and within the OU-1 Ponds.   |       |      |           |
| Has the percent hummock been reported for the plots within the OU-1 Middle Marsh?  | Yes X | No   | Unknown   |
| <b>Comment:</b> The 2002 Wetland Monitoring Report included percent hummock within the OU-1 Middle Marsh Plots.  |       |      |           |
| Has greater than 25% mean areal coverage of hummocks within the OU-1 Middle Marsh restoration area been maintained?  | Yes   | No   | Unknown X |
| <b>Comment:</b> According to the 2002 Wetland Monitoring Report, both OU-1 Middle Marsh plots contained greater than 25% hummock.  |       |      |           |
| Has photographic documentation from fixed plot locations been provided for the spring and fall monitoring events for the first three years?  | Yes   | No X | Unknown   |
| <b>Comment:</b> Photographs of the various restoration areas were provided in the 2002 Wetland Monitoring Report from roughly the same location in spring and summer of 2002. However, Contractor should include photographs of the fixed plots during both the spring and late summer monitoring events. The 2002 Report included photographs of the vegetation sampling plots only from the September monitoring event, while both the spring and late summer events should be documented. |       |      |           |

|  |       |      |         |
|--|-------|------|---------|
| <b>III. HYDRIC SOILS</b>   |       |      |         |
| Has an annual soil profile description for test pits within the 13 sampling plots been produced annually for the first three years, at the end of the fifth growing season, and every five years thereafter?   | Yes X | No   | Unknown |
| <b>Comment:</b> The 2002 Wetland Monitoring Report included a soil description of test pits adjacent to the permanent sampling plots. This is the first of the three annual soil profile descriptions required.  |       |      |         |
| <b>IV. MAINTENANCE</b>   |       |      |         |
| Has the Contractor been performing periodic replanting in areas where the vegetation did not survive?  | Yes X | No   | Unknown |
| <b>Comment:</b> The Contractor has installed several hundred additional plants in the OU-1 areas. In addition, willow stakes were installed in March 2002 in an effort to replace dead woody plantings. Additional replacements are anticipated since the Contractor has acknowledged that none of the restored areas meet the 80% survivorship requirement for woody species. In addition, the north bank of the OU-1 Ponds where golfers had significantly disturbed the vegetation has been reseeded and protected with the installation of a permanent fence; however, the Contractor should inspect the plantings that are required within the three planting zones along the bank of the pond and replace any lost plants.   |       |      |         |
| Has the Contractor been providing adequate control of invasive species in the OU-1 restoration and mitigation areas?   | Yes   | No X | Unknown |
| <b>Comment:</b> The Contractor agreed to use mechanical and/or chemical methods to suppress the population of invasive species to allow the non-invasive species the opportunity to establish without great competition. Middle Marsh has been overtaken by cattail ( <i>Typha</i> sp.) and common reed ( <i>Phragmites australis</i> ). EPA has specifically requested that this problem be aggressively addressed. The population of invasive plants species within OU-1 Middle Marsh Restoration Area and Mitigative Area- West appears to be in control; however, Mitigative Area- East contains a high percentage of invasive coverage. The Contractor has been cutting and spraying invasive species during the spring of 2003; however, the effort appears to be too small to make a substantial difference in the total cover and spread of the species.                             |       |      |         |
| Is erosion being controlled at:  |       |      |         |
| - Stream Channel?  | Yes X | No   | Unknown |
| - OU-1 Tributary 2?  | Yes X | No   | Unknown |
| - OU-1 Ponds?  | Yes X | No   | Unknown |
| - OU-1 Middle Marsh restoration area?  | Yes X | No   | Unknown |
| <b>Comment:</b> The north bank of the OU-1 Pond A was consistently disturbed by golfers, resulting in the loss of vegetation and erosion of the bank. A permanent fence to keep out golfers was provided during the end of the 2002 growing season. The Contractor has since seeded the area, and in July 2003 appeared to contain a high percentage of vegetation coverage. The south end of the OU-1 Middle Marsh restoration area contains a stormwater pipe that apparently discharges from nearby Route 140. During the initial growing season, the flow from this pipe, and sheetflow from the adjacent fairway, washed topsoil away in this area. Vegetation has been established, however, this area should be monitored for future erosion control problems. A status of the area should be provided in the next 5-year review. The OU-1 Tributary contributed a silty discharge to |       |      |         |

the Unnamed Stream just north of Hathaway Road throughout a majority of the 2002 growing. This area should be watched to determine if maintenance of the basin is required.

**Comment:** The OU-1 Tributary 2 was discharging silty water into the Unnamed Stream for several months during 2002. Water in Tributary 2 was noted as very silty during the same time. Reasons for the TSS should be defined and rectified if this scenario repeats itself in the future. By late fall 2002, the water discharging from the OU-1 Tributary 2 was no longer silty.

**Sullivan's Ledge Superfund Site**  
**Wetlands Restoration Area (OU-2)**  
**Site No.**  
**5-Year Review Checklist**

The following checklist was created to review construction of the mitigation wetlands on the north side of Hathaway Road. The Performance Standards stated in the Final Operation and Maintenance (O&M) Plan Second Operable Unit were used as a basis for the OU-2 Wetland Restoration Area checklist.

|  |     |      |           |
|--|-----|------|-----------|
| <b>I. Biological Indicators</b>  |     |      |           |
| <b>Survival</b>  |     |      |           |
| Did 80% of the plantings of each species in the restored wetland survive after five years?   | Yes | No   | Unknown X |
| Have dead or moribund plants been replaced at the earliest possible time consistent with the growing season to achieve a minimum of the original plant density?  | Yes | No   | Unknown X |
| <b>Comment:</b> Although the survivorship requirement of 80% is not required to be met until five years following wetland restoration, the post-construction annual monitoring reports should include survival data. According to the 2002 Annual Wetland Monitoring Report, neither the Adjacent Wetland nor the OU-2 Middle Marsh has achieved the 80% survival rate for woody species. However, this was a qualitative assessment and no data was presented to support these findings. Given the shape and size of the permanent vegetation sampling plots, tallying the woody species in these plots may not be an effective method to determine if the OU-2 restoration areas meet this 80% survival standard. The Contractor has modified the spring sampling plots to include a 30-foot radius plot for sampling woody species around the center of the existing 100 square foot plots. This modification was an attempt to include more woody species during the sampling event; however, the results from the spring 2003 monitoring event will not anticipated to be received until after the late summer 2003 monitoring event. It is unknown if this new method will be more representative of conditions in Middle Marsh and the Adjacent Wetland than the original method. |     |      |           |
| <b>Tree Growth</b>   |     |      |           |
| Did the tree height and dbh increase every five years at least 20% from original planting height?  | Yes | No   | Unknown X |
| <b>Comment:</b> This standard must be met at the end of the 2006 growing season.   |     |      |           |
| <b>Vegetative Diversity</b>  |     |      |           |
| Was at least one woody and herbaceous non-invasive wetland species, in addition to the planted species, noted after five years and every five years thereafter?  | Yes | No   | Unknown X |
| <b>Comment:</b> This standard must be met at the end of the 2006 growing season.   |     |      |           |
| <b>Vegetative Cover</b>  |     |      |           |
| Has 75% areal coverage of wetland plant species been achieved?   | Yes | No X | Unknown   |
| If 75% areal coverage of wetland plant species has <u>not</u> been achieved by the second growing season, has a plan of action been submitted?   | Yes | No   | N/A X     |

|  |       |      |           |
|--|-------|------|-----------|
| <b>Comment:</b> The goal of the 75% areal coverage has been correctly interpreted by the Contractor to include only non-invasive wetland species. The 2002 Wetland Monitoring Report indicates that neither the Adjacent Wetland nor the OU-2 Middle Marsh restoration areas meet the 75% criterion for percent areal coverage. However, the data presented in the report has been questioned and a response is pending at this time.  |       |      |           |
| Are greater than 50% of the dominant plants, exclusive of invasive species, wetland species?   | Yes X | No   | Unknown   |
| <b>Comment:</b> The Contractor agreed to use mechanical and/or chemical methods to suppress the population of invasive species to allow the non-invasive species the opportunity to establish without great competition. Middle Marsh has been overtaken by cattail ( <i>Typha</i> sp.) and common reed ( <i>Phragmites australis</i> ). EPA has specifically requested that this problem be aggressively addressed. The population has grown quite large and it will take a large effort to control them. The 2002 Wetland Monitoring Report, however, indicates that greater than 50% of the dominant species within the OU-2 sampling plots are non-invasive wetland species. The data presented in the report has been questioned and a response is pending at this time; however, an independent assessment of the plots was made during June 2003 and greater than 50% of the dominant plants, exclusive of invasives, were wetland species. |       |      |           |
| <b>II. Mystic Valley Amphipod (MVA)</b>  |       |      |           |
| OU-2 wetland areas with suitable MVA habitat restored based on presence of MVA in restored OU-2 areas?   | Yes   | No X | Unknown   |
| Plan for re-establishment required due to lack of presence of MVA within 3 years of initiation of restoration (in 2000)?   | Yes   | No   | Unknown X |
| <b>Comment:</b> The 2002 Wetland Monitoring Report indicates that no evidence of the Mystic Valley Amphipod was found in the restored OU-2 areas during the three sampling events in spring of 2002. However, it will not be until after the 2003 sampling events that a plan for re-establishment will be required if the species is not found during that time.  |       |      |           |
| <b>III. Wetland Substrate/Soils</b>  |       |      |           |
| <b>Physical Substrate Restoration</b>  |       |      |           |
| Have areas of eroded soil been repaired?   | Yes X | No   | Unknown   |
| Are hydric soils present based on soil profile descriptions?   | Yes X | No   | Unknown   |
| <b>Comment:</b> The goal for restored wetland soils will be a trend for soils from all ten borings to meet the definition of hydric within ten years. However, based on soil data included in the 2002 Wetland Monitoring Report, the soils within the restored areas are showing positive indicators of ground water presence within 12 inches of the ground surface during the growing season.   |       |      |           |
| Has 25% mean areal coverage of hummocks in Middle Marsh been achieved?   | Yes   | No   | Unknown X |
| <b>Comment:</b> Data within the 2002 Wetland Monitoring Report indicate that both Middle Marsh Plots #2 and #4 contain greater than 25% hummocks. Less than 25% of Middle Marsh Plot #1 was identified as hummock, and no information regarding hummocks was provided in the 2002 report for Middle Marsh Plot #3. Therefore, the data is considered inconclusive.   |       |      |           |
| <b>IV. Wetland Hydrology</b>   |       |      |           |
| - Restored wetland sediments replicate water retention characteristics of the pre-remediation conditions?  | Yes   | No   | Unknown X |
| <b>Comment:</b> No discussion of the water retention characteristics of the sediments was presented in the 2002 Wetland Monitoring Report. This topic should be addressed by the Contractor in future reports using comparison of baseline and current sediment samples.   |       |      |           |

|   |       |      |           |
|---|-------|------|-----------|
| Depth to groundwater less than 12 inches at piezometer locations?   | Yes X | No   | Unknown   |
| Hydrology restored to pre-remediation conditions in Middle Marsh?   | Yes   | No   | Unknown X |
| <p><b>Comment:</b> The 2002 Wetland Monitoring Report indicates that the depth to groundwater was less than 12 inches at piezometer locations with the exception of the August readings. However, the area of Sullivan's Ledge was in a Drought Watch during the month of August. The data in the report has been questioned and a response is pending. No discussion of whether or not hydrology has been restored to pre-remediation conditions in Middle Marsh is included in the 2002 Wetland Monitoring Report. The Contractor should address this question in future reports, if not earlier.</p>   |       |      |           |
| <b>V. Post-Construction and Long-Term Monitoring</b>  |       |      |           |
| Are post-construction and long-term monitoring events occurring annually and every five years, respectively? (O&M 1/99 4.2)   | Yes X | No   | Unknown   |
| Are monitoring reports being prepared and submitted for review in accordance with the monitoring programs? (O&M 1/99 4.5)   | Yes X | No   | Unknown   |
| Are corrective actions required for death or failure of plants to properly grow? (O&M 1/99 4.4)   | Yes X | No   | Unknown   |
| Are corrective actions required for excessive plant damage caused by animals? (O&M 1/99 4.4)  | Yes   | No X | Unknown   |
| Are corrective actions required for invasion of opportunistic plant species into restoration areas? (O&M 1/99 4.4)  | Yes X | No   | Unknown   |
| Are corrective actions required for erosion of an amount of topsoil/backfill that modifies the topography of restoration areas to a degree that it would affect the success of restoration in those areas? (O&M 1/99 4.4)   | Yes   | No X | Unknown   |
| Are corrective actions required for temporary interference with hydrological regimes of Middle Marsh? (O&M 1/99 4.4)  | Yes   | No   | Unknown X |
| <p><b>Comment:</b> Due to plant death, additional woody species continue to be planted in the OU-2 restoration areas. The Contractor agreed to use mechanical and/or chemical methods to suppress the population of invasive/opportunistic species to allow the non-invasive species the opportunity to establish without great competition. Middle Marsh has been overtaken by cattail (<i>Typha</i> sp.) and common reed (<i>Phragmites australis</i>). Purple Loosestrife is also present in large numbers in the Middle Marsh and the Adjacent Wetland. EPA has specifically requested that this problem be aggressively addressed. The populations have grown quite large and it will take a strong effort to control them. No discussion of the hydrological regimes of Middle Marsh was included in the 2002 Wetland Monitoring Report; however, this issue should be addressed by the Contractor.</p> |       |      |           |



**ATTACHMENT 6**  
**URS PROGRESS REPORT**

CC: E. Hoffman  
D. Cippitelli  
~~D. [unclear]~~  
F. [unclear] #119 Sullivan  
00-2

December 17, 2002

PN: 28367-007

Mr. David O. Lederer  
Remedial Project Manager  
U.S Environmental Protection Agency, Region 1 (HBO)  
1 Congress Street Suite 1100  
Boston, Massachusetts 0211402023

RE: Progress Report for Operation & Maintenance, Sullivan's Ledge Superfund Site, Second Operable Unit, New Bedford, Massachusetts

Dear Mr. Lederer:

This letter describes actions taken over the two month period from October through November 2002 with respect to accomplishing the Operation and Maintenance (O&M) for the Second Operable Unit (OU2) at the Sullivan's Ledge Superfund site.

#### **I. ACTIVITIES PERFORMED**

- Harding ESE performed the fall inspection on November 20, 2002 in accordance with the requirements of the approved O&M Plan. Specifically, Harding ESE conducted a general site inspection within the OU2 area.
- Harding ESE collected a round of water level measurements on October 18, 2002. Results of these measurements are included with this report.
- NEE performed wetland maintenance work throughout the period. NEE visited the site between September 25, 2002 and November 30, 2002 to perform wetlands maintenance activities.

#### **II. DATA AND/OR TEST RESULTS**

- Water levels in the on site piezometers, wells and staff gauges were measured on October 18, 2002. Table 1 showing historic water levels has been updated and is attached to this report.

#### **III. PROBLEMS ENCOUNTERED OR ANTICIPATED**

None.

URS Corporation  
5 Industrial Way  
Salem, NH 03079-2830  
Tel: 603.893.0616  
Fax: 603.893.6240

PN: 28367-007

December 17, 2002

Page 2


#### IV. ACTIVITIES PLANNED (December 1, 2002 through January 15, 2003)

The anticipated work that will be performed on the project in December and January includes:

- Preparing the OU2 Annual Operation and Maintenance Report for submittal to EPA no later than January 3, 2003.
- Continuing to inspect and generally maintain wetland restoration areas.

If you have any questions or comments regarding the contents of this progress report, please contact us.

Sincerely,

*Marilyn M. Wade*  


Marilyn M. Wade, P.E., LSP  
Project Manager, OU2

#### Attachment (Tables)

cc: Scott Alphonse, City of New Bedford  
Larry Blue, AVX Corporation  
Don Dwight, Metcalf & Eddy  
Jim Heckathorne, OB&G  
Jerry Johnson, Harding ESE  
Mickey Marcus, NEE  
Evelina Vaughan, MADEP  
Steve Wood, ESS

| Monitoring Point | Location                            | T.O.C. Elevation (ft.) | Ground Surface Elevation | 13-Jun-97       |                       | 14-Jun-00       |                       | 23-Jul-97       |                       | 14-Jul-00       |                       | 15-Aug-97       |                       | 9-Aug-00        |                       | 23-Aug-00       |                       | 27-Oct-01            |                       | 30-Apr-02            |                       | 29-Aug-02            |                       | 18-Oct-02            |                       |
|------------------|-------------------------------------|------------------------|--------------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
|                  |                                     |                        |                          | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth (BGS) (1) | Water Elevation (ft.) | Depth to Water (ft.) | Water Elevation (ft.) | Depth to Water (ft.) | Water Elevation (ft.) | Depth to Water (ft.) | Water Elevation (ft.) | Depth to Water (ft.) | Water Elevation (ft.) |
|                  |                                     |                        |                          |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                      |                       |                      |                       |                      |                       |                      |                       |
| WP-1             | Middle Marsh Excav. Limits          | 66.73                  | 62.78                    | +0.01           | 63.31                 | 1.49            | 62.38                 | 0.06            | 63.24                 | 1.56            | 62.31                 | NM              | NM                    | 1.12            | 62.81                 | 1.31            | 62.62                 | 3.95                 | 62.78                 | 3.79                 | 62.94                 | 6.29                 | 60.44                 | 4.09                 | 62.64                 |
| WP-2             | Middle Marsh Excav. Limits          | 65.91                  | 63.41                    | +0.06           | 63.26                 | 1.31            | 62.46                 | +0.06           | 63.26                 | 2.18            | 61.59                 | +0.19           | 63.39                 | 0.49            | 62.52                 | 1.3             | 61.71                 | 3.22                 | 62.69                 | 3.00                 | 62.91                 | 4.73                 | 61.18                 | 3.21                 | 62.70                 |
| WP-3             | Middle Marsh Excav. Limits          | 65.91                  | 62.31                    | +0.85           | 62.85                 | 1.24            | 62.43                 | +0.84           | 62.84                 | 2.32            | 61.35                 | +0.94           | 62.94                 | 0.37            | 62.54                 | 1.39            | 61.52                 | 4.06                 | 61.85                 | 3.70                 | 62.21                 | 5.38                 | 60.53                 | 4.21                 | 61.70                 |
| WP-5             | S. of Middle Marsh                  | 67.01                  | 64.80                    | 0.08            | 64.82                 | NM              | NM                    | 0.3             | 64.6                  | NM              | NM                    | 0.18            | 64.72                 | 0.23            | 64.67                 | 0.36            | 64.54                 | NM                   | NM                    | 2.27                 | 64.74                 | 3.12                 | 63.89                 | 2.45                 | 64.56                 |
| WP-8             | Former OU-2 Div. Swale              | 68.06                  | 63.56                    | NM              | NM                    | NM              | NM                    | NM              | NM                    | NM              | NM                    | NM              | NM                    | NM              | NM                    | NM              | NM                    | NM                   | NM                    | 5.05                 | 63.01                 | 4.82                 | 63.24                 | 7.49                 | 60.57                 |
| NW-7A            | S. of Middle Marsh                  | 66.91                  | 65.41                    | From T.O.C.     | 65.57                 | NM              | NM                    | From T.O.C.     | 65.28                 | NM              | NM                    | From T.O.C.     | 65.42                 | From T.O.C.     | 65.9                  | From T.O.C.     | 65.39                 | NM                   | NM                    | 4.17                 | 62.74                 | 5.53                 | 61.38                 | 2.62                 | 64.29                 |
| NW-8A            | Near Mid. Marsh W. of Pond A        | 66.53                  | 61.73                    | From T.O.C.     | 61.22                 | NM              | NM                    | From T.O.C.     | 62.07                 | NM              | NM                    | From T.O.C.     | 62.68                 | From T.O.C.     | 62.34                 | From T.O.C.     | 61.95                 | NM                   | NM                    | 4.10                 | 62.43                 | NM                   | NM                    | 4.35                 | 62.18                 |
| NW-10A           | NW. of Area 4 (Adj. Wetlands)       | 70.54                  | 66.30                    | From T.O.C.     | 66.76                 | NM              | NM                    | From T.O.C.     | 65.62                 | NM              | NM                    | From T.O.C.     | 66.17                 | NM              | NM                    | From T.O.C.     | 65.71                 | 4.63                 | 65.91                 | 4.12                 | 66.42                 | 6.15                 | 64.39                 | 4.66                 | 65.88                 |
| PZ-19            | Mitigation Area W. of Pond A        | 64.89                  | 62.34                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | 2.94                 | 61.95                 | 2.55                 | 62.34                 | 4.82                 | 60.07                 | 3.65                 | 61.84                 |
| PZ-20            | Mitigation Area E. of Pond A        | 65.38                  | 62.37                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | 2.94                 | 62.44                 | 2.52                 | 62.86                 | 4.73                 | 60.65                 | 2.95                 | 62.43                 |
| PZ-21            | Former OU-2 Div. Swale              | 65.48                  | 63.48                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | 3.88                 | 61.6                  | 2.64                 | 62.84                 | 6.17                 | 59.31                 | 3.10                 | 62.38                 |
| PZ-22            | Former OU-2 Div. Swale              | 67.38                  | 63.70                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      |                       |                      |                       |                      |                       |                      |                       |
| Staff Gauge - 1  | Un-named Strm. H Rd. Headwall       | 70.76 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | 6.01                 | 61.37                 | 3.31                 | 64.07                 | 6.39                 | 60.99                 | 3.90                 | 63.48                 |
| Staff Gauge - 2  | William Tributary No. 2             | 69.46 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      | 67.20                 | 7.38                 | 67.38                 | 3.61                 | 67.15                 | 3.56                 | 67.20                 |
| Staff Gauge - 3  | Un-named Strm. Area 4/Adj. Wetlands | 68.78 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      | 67.20                 | 7.38                 | 67.38                 | 2.31                 | 67.15                 | 2.24                 | 67.22                 |
| Staff Gauge - 4  | Un-named Strm. Creat. Chnl. Area 4  | 69.66 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      | 65.84                 | 2.28                 | 66.50                 | 2.38                 | 66.40                 | 2.38                 | 66.40                 |
| Staff Gauge - 5  | Un-named Strm. Middle Marsh         | 65.79 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      | 66.28                 | 6.50                 | 66.50                 | 3.26                 | 66.40                 | 3.26                 | 66.40                 |
| Staff Gauge - 6  | W Side of Pond A                    | 63.14 (4)              |                          | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    | NI              | NI                    |                      | 63.68                 | 3.49                 | 62.30                 | 2.44                 | 63.35                 | 3.33                 | 62.46                 |
|                  |                                     |                        |                          |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                      | 61.35                 | 1.52                 | 61.62                 | 1.95                 | 61.19                 | 1.86                 | 61.28                 |

- Notes:
- 1) BGS = below ground surface; + = water level above ground surface.
  - 2) NM = not measured
  - 3) NI = not installed
  - 4) Elevation measured at top of green metal post
  - 5) Water levels measured on June 14, 2000 were taken prior to reopening Un-named Stream through Middle Marsh.
  - 6) Water Levels measured on July 14, 2000 were taken a few days after reopening Un-named Stream through Middle Marsh.